REMARKS/ARGUMENTS

Favorable consideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 11-53 are presently pending in this application, Claims 11 and 12 having been amended and Claims 50-53 having been newly added by the present amendment.

In the outstanding Office Action, the specification was objected to for informalities; and Claims 11-49 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sato et al. ("Effect of wavelength on the...") in combination with Nagano et al. (U.S. Patent 5,748,288).

Claims 11 and 12 have been amended and Claims 50-53 have been newly added herein. These amendments and additions in the claims are believed to find clear support in the specification, claims and drawings as originally filed. For example, Claims 52 and 53 are supported by Figures 1 and 2 along with their descriptions in the specification, and amended Claim 11 and new Claims 50 and 51 are supported by page 20, line 25, to page 22, line 20, of the specification as well as Figures 4 and 5. Claim 12 is amended solely for formality. Hence, no new matter is believed to be added thereby.

Before addressing the outstanding rejection, a brief summary of Claim 11 as currently amended is believed to be helpful. Claim 11 is directed to a process for preparing a vitamin D derivative and the process includes: providing a reaction container configured to contain a solution of a provitamin D derivative and an ultraviolet irradiation apparatus configured to irradiate the solution of the provitamin D derivative in the reaction container with an ultraviolet irradiation, the ultraviolet irradiation apparatus comprising an ultraviolet radiation-emitting lamp, an optical system positioned to be struck by light from the ultraviolet radiation-emitting lamp and configured to emit ultraviolet rays having a specific wavelength,

a quartz rod positioned to be struck by the ultraviolet rays from the optical system, and a projection lens positioned to be struck by and to irradiate the solution of the provitamin D derivative in the reaction container with the ultraviolet rays through the quartz rod, the projection lens being configured to control a spot size of the ultraviolet rays having the specific wavelength; irradiating the solution of the provitamin D derivative with the ultraviolet rays having the specific wavelength emitted from the projection lens of the ultraviolet irradiation apparatus to cause a photochemical reaction to the provitamin D derivative solution, thereby forming a previtamin D derivative; and subjecting the previtamin D derivative to a thermal isomerization reaction to prepare the vitamin D derivative. By providing such an ultraviolet irradiation apparatus, the solution can be struck by a proper spot size of the ultraviolet rays according to the size of a light-receiving surface of the solution and/or reaction container, thereby utilizing the ultraviolet rays in a highly efficient manner. As a result, as exhibited in Examples 1 and 4-6, higher yields of previtamin D can be obtained due to higher reaction efficiency irrespective of the amounts of the solutions.[1]

Sato et al. and Nagano et al. disclose an effect of wavelength in the photochemical conversion of cholesta-5, 7-diene-1α, 3β-diol to 1α-hydroxyvitamin D_3 via 1α-hydroxyprevitamin D_3 and an exposure method employing a lighting assembly, respectively. Nevertheless, neither Sato et al. nor Nagano et al. teaches "providing a reaction container configured to contain a solution of a provitamin D derivative and an ultraviolet irradiation apparatus configured to irradiate the solution of the provitamin D derivative in the reaction container with an ultraviolet irradiation, the ultraviolet irradiation apparatus comprising an ultraviolet radiation-emitting lamp, an optical system positioned to be struck by light from the ultraviolet radiation-emitting lamp and configured to emit ultraviolet rays having a specific

[1] See Specification, page 36, line 23, to page 38, line 21, and page 40, line 1, to page 43, line 2.

wavelength, a quartz rod positioned to be struck by the ultraviolet rays from the optical system, and *a projection lens positioned to be struck by and to irradiate the solution of the provitamin D derivative in the reaction container with the ultraviolet rays through the quartz rod,* the projection lens being configured to control a spot size of the ultraviolet rays having the specific wavelength" as recited in amended Claim 11 (emphasis added in italic). On the other hand, Sato et al. in the noted "*UV irradiation of 1α-OH-7-DHC solution*" portion simply states that "[f]our ml of a solution ... was taken in a quartz cell ...placed in a spectroirradiator" and that "[a]fter setting wavelength and integrator to obtain the desired monochromatic UV ray and quantum of energy, irradiation was performed." Nagano et al. discloses a lighting assembly suitable for exposure processes in the production of semiconductor devices and LCD devices,[2] and as stated in the previous Office Action, Nagano et al. clearly does not teach or suggest an ultraviolet irradiation apparatus which irradiates a solution of the provitamin D derivative with ultraviolet rays. Therefore, the subject matter recited in Claim 11 is believed to be patentably distinguishable from both Sato et al. and Nagano et al.

Turning to Claim 52, Claim 52 is directed to a process for preparing a vitamin D derivative and the process includes: providing a reaction container configured to contain a solution of a provitamin D derivative and an ultraviolet irradiation apparatus configured to irradiate the solution of the provitamin D derivative in the reaction container with an ultraviolet irradiation, an optical system positioned to be struck by light from the ultraviolet radiation-emitting lamp and configured to emit ultraviolet rays having a specific wavelength, and a quartz rod positioned to be struck by the ultraviolet rays from the optical system and configured to directly irradiate the solution of the provitamin D derivative in the reaction

[2] Nagano et al., column 1, lines 6-10.

container with the ultraviolet rays; irradiating the solution of the provitamin D derivative in the reaction container with the ultraviolet rays emitted from the quartz rod of the ultraviolet irradiation apparatus to cause a photochemical reaction of the provitamin D derivative and form a previtamin D derivative; and subjecting the previtamin D derivative to a thermal isomerization reaction to prepare the vitamin D derivative. By providing such an ultraviolet irradiation apparatus, the solution is struck by the ultraviolet rays in a highly efficient manner, thereby promoting the photochemical conversion of the provitamin D derivative to a previtamin D derivative at significantly high rate.[3]

Neither Sato et al. nor Nagano et al. teaches "providing a reaction container configured to contain a solution of a provitamin D derivative and an ultraviolet irradiation apparatus configured to irradiate the solution of the provitamin D derivative in the reaction container with an ultraviolet irradiation, the ultraviolet irradiation apparatus comprising an ultraviolet radiation-emitting lamp, an optical system positioned to be struck by light from the ultraviolet radiation-emitting lamp and configured to emit ultraviolet rays having a specific wavelength, and *a quartz rod positioned to be struck by the ultraviolet rays from the optical system and configured to directly irradiate the solution of the provitamin D derivative in the reaction container with the ultraviolet rays*" as recited in Claim 52 (emphasis added in italic). As discussed above, Sato et al. simply states placing a quartz cell containing a solution in a spectroirradiator and irradiating it after setting wavelength and integrator to obtain the desired monochromatic UV ray and quantum of energy, whereas Nagano et al. only discloses a lighting assembly for the production of semiconductor devices and LCD devices and does not teach or suggest a quartz rod to irradiate a solution of the provitamin D derivative with

[3] See Specification, page 38, line 22, to page 39, line 27, and page 43, line 5, to page 44, line 3.

ultraviolet rays. As such, the subject matter recited in Claim 52 is believed to be distinguishable from Sato et al. and Nagano et al.

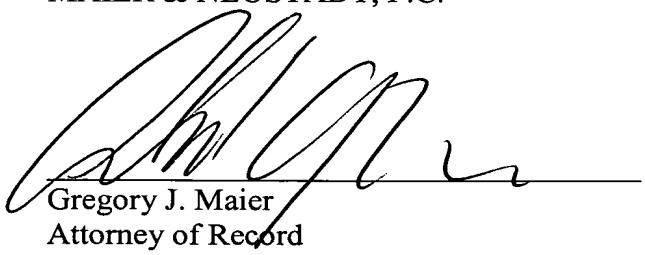
Because neither Sato et al. nor Nagano et al. discloses the providing steps as recited in amended Claim 11 and new Claim 52, even the combined teachings of these cited references are not believed to render the processes recited in Claims 11 and 52 obvious.

For the foregoing reasons, Claims 11 and 52 are believed to be allowable. Furthermore, since Claims 12-51 and 53 depend directly or indirectly from either Claim 11 or 52, substantially the same arguments set forth above also apply to these dependent claims. Hence, Claims 12-51 and 53 are believed to be allowable as well.

In view of the amendments and discussions presented above, Applicants respectfully submit that the present application is in condition for allowance, and an early action favorable to that effect is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Gregory J. Maier
Attorney of Record
Registration No. 25,599

Akihiro Yamazaki
Registration No. 46,155

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)

GJM/AY:fm
I:\ATTY\AKY\24S\246111DIV\AME 2.DOC